

SNA 4600

Standalone ATM Network Adaptor

Configuration guide



***A self-contained system for dial-up wide area networking
of professional quality TV and broadband data ...***

Product overview

SNA 4600 performs the processing of MPEG-2 DVB Transport Stream and other data services for transmission on PDH/SDH networks under ATM layering. It is a self-contained system, perfectly suited for broadcasters' needs

Key features:

- ↳ A unique network interfaces family
- ↳ Self-contained system
- ↳ Powerful ATM multiplexing
- ↳ Multiple service capability
- ↳ Dial-up connection capability
- ↳ Full duplex transmission
- ↳ ATM Adaptation Layers type 1 and type 5 for real time services
- ↳ Local and remote control capability
- ↳ DVB, ITU-T and ATM Forum standards compliant

The SNA 4600 Standalone Network Adaptor connects costumer's TV equipment to leased lines, to PDH and to SDH networks but also to ATM networks enabling dial-up transfer of professional TV at user-selected quality. Allowing processing of other data streams, it features a versatile multiple service communication network interface.

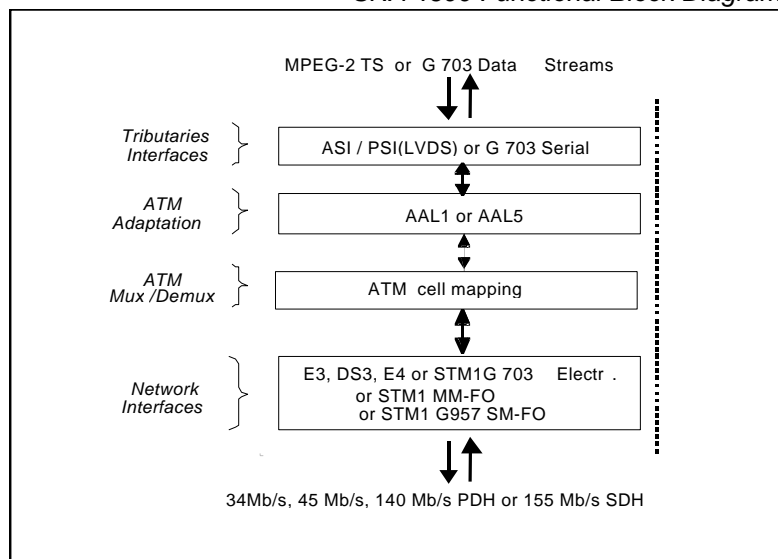
The SNA 4600 supports serial or parallel MPEG-2 TS, as well as G703 2, 8, 34 or 45 Mbps data stream tributaries. AAL1 or AAL5 layering may be chosen depending on customer needs and requested Quality of Service.

The ATM multiplexed services are inserted into a single PDH stream (E3, DS3 or E4) or into an SDH VC4 virtual container. The SDH output can be configured with either electrical or optical interfaces.

It is designed as a 3 RU-19", self-contained sub-rack unit. It can be populated with up to 8 boards, by combining MPEG TS or data streams tributary ATX and ARX cards, and up to two User Network Interfaces (UNI) boards.

It can be controlled and monitored either from the front panel keypad and illuminated LC Display, or remotely from the DBE 2930 proprietary manager system through an RS 485 linked DBE 2910 Mediation Unit.

SNA 4600 Functional Block Diagram



Benefits

A unique network interfaces family

Together with the TNA 4600 and CNA 4600 systems, the SNA 4600 forms a unique family of network interfaces which addresses the variety of needs in network design and throughput, for single service as well as multiple services architecture.

Self-contained system solution

In one modular compact product, the SNA 4600 offers a comprehensive range of digital video and data communications services, provides full ATM multiplexing and network single or dual termination functionality. With the self-contained design of the SNA 4600 system, the Operators enjoy the benefits of full compatibility between all functions, integrated management and simplification of configuration and maintenance operations.

Powerful ATM multiplexing

With up to 7 transport stream multiplexing capability within a 3 RU- 19" chassis, the SNA 4600 is a powerful system, which saves headroom in operational centers (or hubs) for additional equipment.

Multiple service capability

In addition to its powerful capability MPEG-2 Transport Stream multiplexing, the SNA 4600 offers through its circuit emulator the capability to mix other digital services in the same telecom network channel, thus ensuring efficient data transfer and gives the operators the flexibility to adjust the network communications according to market needs.

Dial-up connection capability (option)

The service end-user selects the far-end party and the call parameters by dialling. Connections are automatically established, performing ATM User-to-Network Interface signalling.

Full Duplex transmission

Thanks to its full duplex transmission capability the CNA 4600 series features universal interfaces for contribution network interface for MPEG-2 transport whatever the User-to-Network Interface is (PDH, SDH or leased lines).

ATM Adaptation Layers type 1 and type 5 for real time services

When type 1 Forward Error Correction, Reed Solomon and interleaving can be used to enhance the residual bit error rate, AAL type 5 can be selected to allow interoperability with AAL type 5 only based equipment (servers...).

Local or remote control capability

All SNA 4600 components can be controlled and monitored either locally through the menu-driven illuminated LC Display and front panel keypad which provides monitoring facilities as well as control of selected parameters.

It can also be remotely managed by the DBS 2930 integrated system manager through an RS 485 bus link which provides a Graphical User Interface for configuration, status and fault monitoring.

DVB, ITU and ATM Forum standards compliant

SNA 4600 strict adherence to DVB and ATM standards ensures interoperability with any other standard-based equipment.

Features and Capabilities

SNA 4600 Interfaces capability

Tributaries Interfaces capability

Tributary Interfaces are available for:

- Serial DVB-ASI or parallel DVB-SPI formats, in compliance with prEN50083-9 standard, from 2 to 60 Mb/s.
- 2, 8, 34 or 45 Mb/s Data Streams as G703 formatted data tributaries.

Network Interfaces capability

User Network Interfaces are available for:

- PDH Electrical interfaces: 34 Mb/s (E3); 45 Mb/s (DS3); 140 Mb/s (E4)
- SDH Electrical interfaces: 155 Mb/s (STM1 and STS3c - on request)
- SDH Optical interfaces: 155 Mb/s (STM1 and STS3c – on request) Single-Mode or Multi-Mode Fiber

MPEG-2 TS Processing

The 3 MPEG2-TS packet formats, as defined by DVB, are supported.

The “flying wheel” synchronisation mechanism is in accordance with ETS300813 and ETS 300814 standards; if synchronisation is lost no packet is transmitted.

Circuit Emulation Processing

The Circuit Emulation provides an AAL1 adaptation layer with an interleaved Reed-Solomon forward error correction mechanism.

Full AIS detection and generation, is propagated thereby enabling clock holdover in event of signal loss.

ATM Adaptation

ATM multiplexing performs the asynchronous multiplexing of incoming MPEG-2 stream to form a flow of ATM useful cells. ATM demultiplexing performs the reciprocal function on the basis of VPI (Virtual Path Identifier) and VCI (Virtual Channel Identifier) filtering.

For G703 Data Stream Tributaries only the ATM Adaptation Layer-1 (AAL1) is available.

ATM Cell Mapping

ATM multiplexing performs the asynchronous multiplexing of the individual tributary data to form a flow of ATM cells. ATM demultiplexing performs the reverse function on the basis of VPI (Virtual Path Identifier) and VCI (Virtual Channel Identifier) filtering.

Both functions are simultaneously available.

Dialling (option)

The SNA 4600 offers on-demand connections over a B-ISDN systems. The signalling protocol supported conforms to the ATM Forum UNI 3.1 protocol.

The ATM multiplexer allows for 7 access points for on-demand connections (Virtual Ports). Each tributary board can be linked to these Virtual Ports.

Three kinds of connections can be set up: one way point-to-point, one way point-to-multipoint and two way (point-to-point) connections.

In the point-to-multipoint mode, up to 7 remote users can be connected simultaneously.

As specified by the UNI3.1 protocol, the point-to-multipoint connection can be established only by the sender.

Control and management

The SNA 4600 (configuration) can be controlled and managed either locally through its front panel keypad and LC display, or remotely through an RS 485 link by the DBS 2910 main system manager.

The parameters that the user can control are: Tributary mix, Tributary modes, VPI/VCI, ATM Adaptation Layer type (AAL1/AAL5); Max Cell Rate; Physical Layer configuration.

Monitoring

Extensive monitoring, troubleshooting and performance data gathering of the SNA 4600 are achieved either through the front panel MMI or under the DBS 2930 system manager

One dry loop alarm is available on the equipment

Product outlook

The SNA 4600 is designed as a 3 RU - 19", standalone, rack mounted chassis.

Eight rear panel slots are available for tributaries and network interfaces boards, under the following limitations:

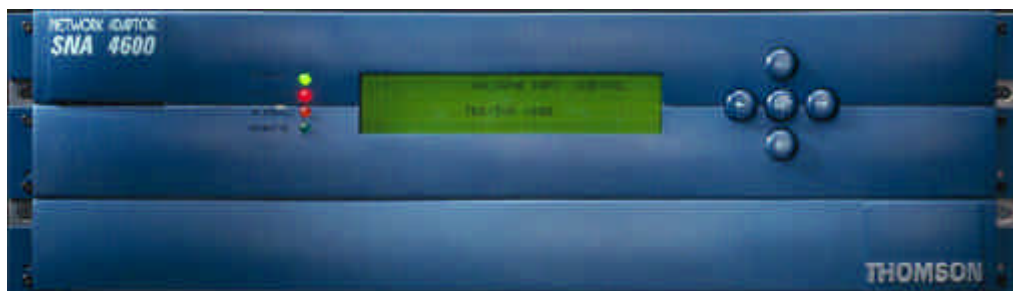
- Single UNI configuration: up to 7 TX or RX cards
- Dual UNI configuration: up to 3 TX or RX cards per UNI card

Two other rear panel slots are dedicated to power supply units with active redundancy capability (optional).

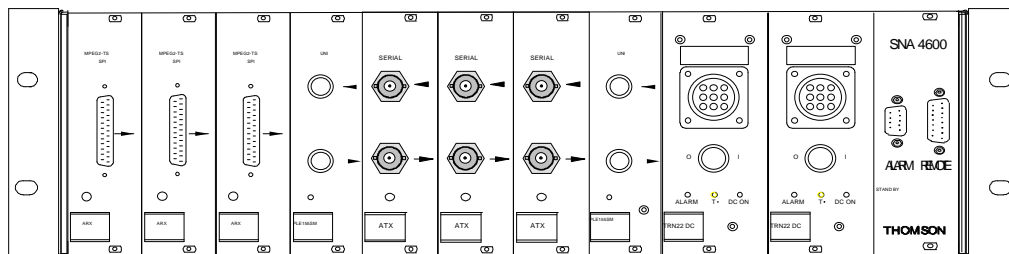
A 15-pin SubD connector is provided for remote management.

A 9-pin SubD connector is provided for dry contact alarm.

Front Panel



Back side (Dual UNI configuration example)



Technical Specifications

MPEG-2 TS Tributaries Interface Capability

TX and RX ASI Serial Interfaces:

Comply with EN 50083-9 ASI electrical (DVB-PI)

Data rate: 2 to 60 Mbps

Connector type: Female BNC, 75 Ω impedance

TX and RX SPI Parallel Interfaces (LVDS)

Comply with EN 50083-9 parallel

Data rate: 2 to 60 Mbps

Connector type: Female 25-pin subD, 100 Ω impedance

Data Stream Tributaries Interface Capability

TX and RX Serial Interfaces

Data rates: 2.048 Mbps; 8.8848 Mbps; 34.368 Mbps; 44.736 Mbps

ITU-T G 703 standard compliant

Connector type: Female BNC, 75 Ω impedance

Jitter tolerance as per ITU- G823

User-to-Network Interface Capability

PDH Electrical Interfaces:

Comply with ITU-T G 703

Data rate: 34.368 Mbps (E3); 44.736 Mbps (DS3); 139.264 Mbps (E4)

Connector type: Female BNC, 75 Ω impedance

SDH Electrical Interfaces:

Comply with ITU-T G 703

Data rate: 155.520 Mbps (STM-1)

Connector type: Female BNC, 75 Ω impedance

SDH Single-Mode Optical Interfaces:

Comply with ITU-T G 957 S1.1 (short haul)

Data rate: 155.520 Mbps (STM-1 & STS3c – on request)

Connector type: SC duplex

SDH Multi-Mode Optical Interfaces:

Data rate: 155.520 Mbps (STM-1 & STS3c - on request)

Connector type: SC duplex

Fiber type: 62.5/125/0.275 NA

Control Interfaces

Front panel illuminated LC Display and keypad

Rear panel 15-pin SubD connector for RS 485 remote control

Rear panel 9-pin SubD connector for two dry contacts alarm.

Transmission Capability

Tributaries effective bit rate versus the network bit rate:

Network bit rate (Kbps)	Tributaries effective bit rate (Kbps)
34,368 (E3)	29,131
44,736 (DS3)	37,967
139,264 (E4)	118,727
155,520 (STM-1)	128,653

Multiple Service Capability

ATM Multiplexing of MPEG-2 TS and G703 data streams
up to 7 TS for single UNI throughput
up to 2x3 TS for dual UNI throughput

Signalling Capability (option)

Full ATM UNI broadband switched services
(Supports SVC, PVC)
Complies with UNI 3.1

ATM Adaptation Layer

ATM Adaptation Layer type 1 (AAL1)

Compliant with ITU-T recommendation I.363
Compliant with ITU-T recommendation J.82
Bit errors and cell losses correction mechanism RS (128,124) x 47
Adaptive source clock frequency recovery mechanism

ATM Adaptation Layer type 5 (AAL5)

Compliant with ITU-T recommendation I.363
Compliant with ITU-T recommendation J.82
CRC based error detection mechanism
Adaptive source clock frequency recovery mechanism

Management

Services Connections management:

complies with UNI 3.1 ATM Forum protocol
controlled either from front panel keypad (in shortform mode) or from a remote manager (in explicit mode)
100 port descriptors address book downloadable in NVRAM

SNA 4600 control and monitoring:

operated either from front panel keypad or from a remote manager

Alarm interfaces:

One dry contact alarming on rear panel (configurable)
(9-pin SubD connector)

Power

Auto ranging 100-240 Vac, 50/60 Hz universal power supply
or 48-60 Vdc power supply
90 W maximum, depending on equipment population

Physical

Width 483 mm (19") height 132 mm (3RU) depth 350 mm
Weight 11 kg maximum, fully populated

Operating Conditions

Ambient temperature 0°C to 45°C

Compliance with Standards

- ISO/IEC 13818-1 MPEG-2 TS Layer specification
- ITU-T G. 702 Plesiochronous Digital Hierarchy
- ITU-T G. 707 Synchronous Digital Hierarchy
- ITU-T G. 703 Physical/electrical characteristics of hierarchical digital interfaces
- ITU-T G. 804 ATM cell mapping into PDH
- ITU-T I.432 B-ISDN UNI – Physical Layer specification
- ITU-T I.361 B-ISDN ATM Layer specification
- ITU-T I.363 B-ISDN AAL Layer specification
- ITU-T J. 82 Transport of MPEG-TS streams
- ITU-T J. 131 Transport of MPEG2 signals in PDH networks
- ITU-T J. 132 Transport of MPEG2 signals in SDH networks
- ETS 300813 DVB interfaces to PDH networks
- ETS 300814 DVB interfaces to SDH networks
- ATM Forum User-Network Interface (UNI) Signalling Specification, Version 3.1

Ordering Information

- SNA 4600 chassis

Models	Descriptions
N4640000AE	SNA4600 single UNI chassis
N4642000AE	SNA4600 dual UNI chassis
N4631000AA	Power supply CAC 110/220V – 150W
N4630100AA	Power supply TRN22DC 48V – 90W
N4631100AA	Power supply 48V – 150W, DCI Mode
N4631100BA	Power supply 48V – 150W, DCC Mode

- SNA 4600 Tributary Interface Components

Models	Descriptions
N4611000AE	MPEG-2 TS SPI (parallel) Transmitter board, V4.0
N4611010AE	MPEG-2 TS ASI (serial) Transmitter board, V4.0
N4611100AE	2Mbps Data Stream Transmitter board
N4611110AE	8Mbps Data Stream Transmitter board
N4611120AE	34Mbps Data Stream Transmitter board
N4611130AE	45Mbps Data Stream Transmitter board
N4612000AE	MPEG-2 TS SPI (parallel) Receiver board, V4.0
N4612010AE	MPEG-2 TS ASI (serial) Receiver board, V4.0
N4612020AE	MPEG-2 TS SPI (parallel) Receiver board, dual output, V4.0
N4612100AE	2Mbps Data Stream Receiver board
N4612110AE	8Mbps Data Stream Receiver board
N4612120AE	34Mbps Data Stream Receiver board
N4612130AE	45Mbps Data Stream Receiver board

- SNA 4600 User-to-Network Interface Components

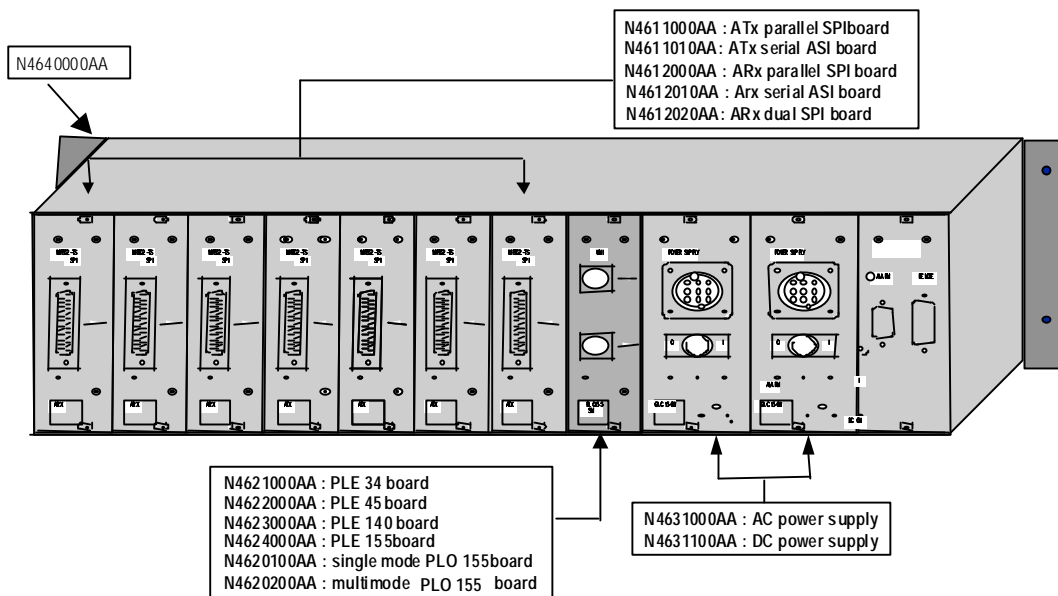
Models	Descriptions
N4620100AE	SDH-STM1 Single-mode optical interface board, V4.0
N4620200AE	SDH-STM1 Multi-mode optical interface board, V4.0
N4621000AE	PDH 34 Mbps (E3) electrical interface board, V4.0
N4622000AE	PDH 45 Mbps (DS3) electrical interface board, V4.0
N4623000AE	PDH 140 Mbps (E4) electrical interface board, V4.0
N4624000AE	SDH 155 Mbps (STM-1) electrical interface board, V4.0

- SNA 4600 options

Model	Description
N46SSG31AA	UNI 3.1 signalling Software (1 per UNI board)

Configuration Information

– Single UNI Configuration



– Dual UNI Configuration

